

IntesisBox[®] KNX

Airzone InnoBUS



User's Manual
v10 r11 eng

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Gateway for the integration of the Airzone InnoBUS system with Konnex TP-1 (EIB) control systems.

Order Codes:

IBOX-KNX-AIRZONE

Basic model supporting integration to up to 4 System Controllers (CS) and 128 Zones in the Airzone system.

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1. Description

This document describes the integration of Konnex TP-1 (EIB) systems with Airzone InnoBUS devices using the gateway *IntesisBox KNX – Airzone InnoBUS*.

This document assumes that the user is familiar with Konnex and Airzone InnoBUS technology and technical terms.

From now on, and with the aim of easy the read of this document, just the word "IntesisBox" will be used instead of the full gateway model description "IntesisBox KNX – Airzone InnoBUS". Also the abbreviation KNX is used instead of the full name Konnex.

This chapter gives a general description of the Airzone InnoBUS system, describing the components related with the integration.

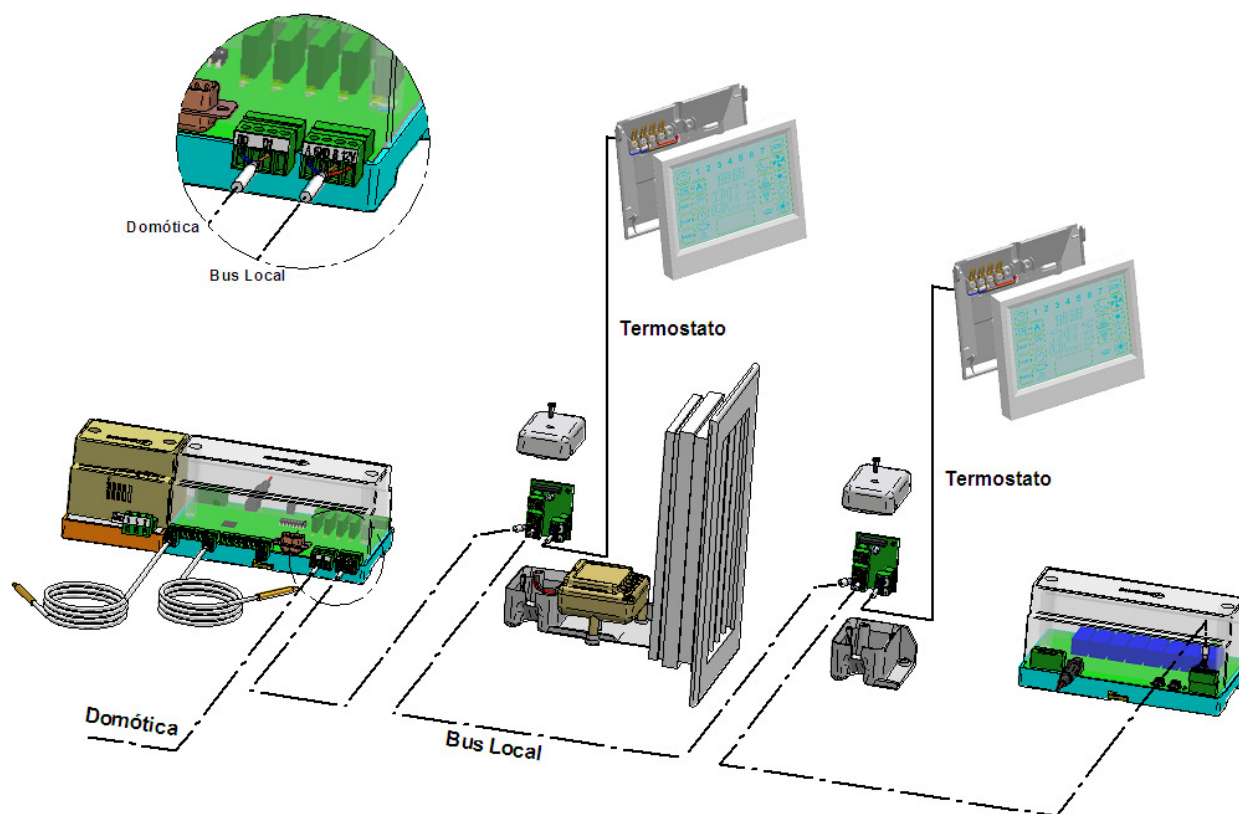
1.1 Introduction to InnoBUS system

The Airzone InnoBUS is a system for **Control of Climatization by zones**, and it can manage air conditioning systems as well as heating systems. InnoBUS controls equipment with air heat pump or also chillers and fancoils, so it can work in cold mode or in heat mode; also systems of heat radiation can be controlled, as for example radiation floors or wall heaters.

This way, a global climatization system is obtained with the advantages of all the individual systems, obtaining a climatization system comfortable and with a fast response.

The final user is who decides the climatization system to use in every moment, being able also to use every one of them independently (air heating or radiation heating) or both simultaneously, reaching the room comfort temperature quickly through the heat pump (air) and maintaining this temperature through the radiation system (more comfortable).

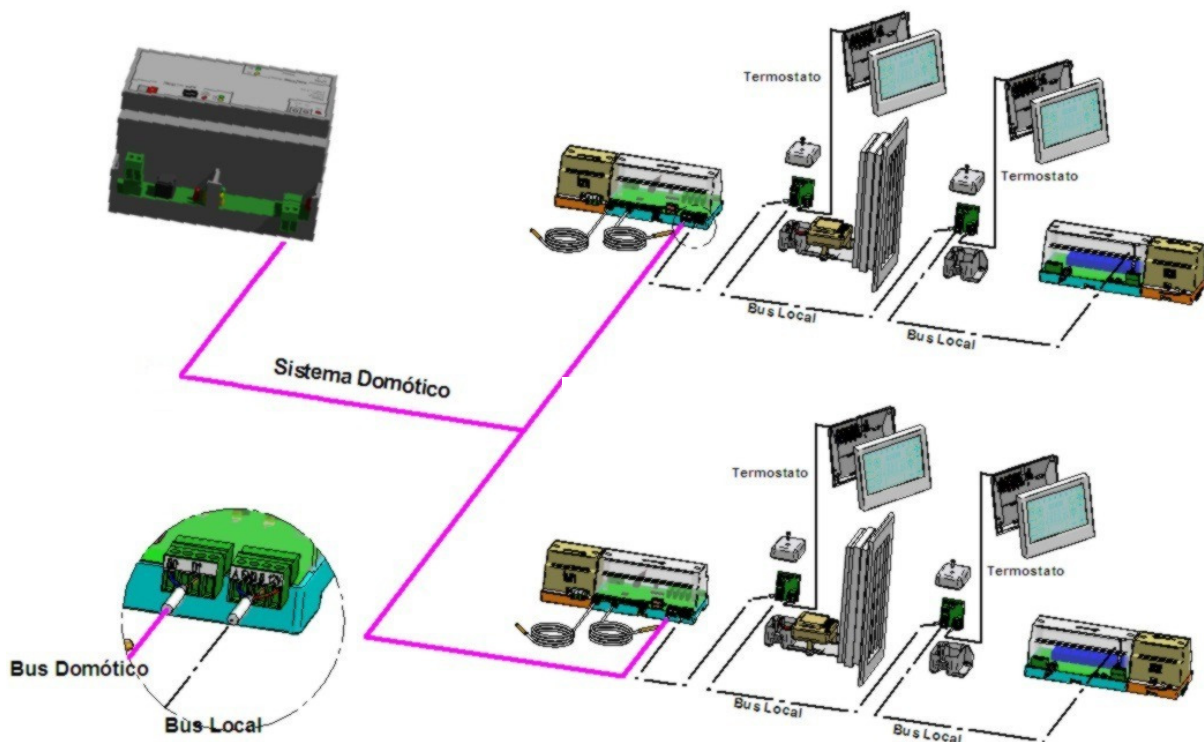
The InnoBUS system is composed of a System Controller (CS) and up to 32 modules for Zone (or Local) control (CL). To every zone it can be associated a thermostat, a motorised grille and/or an electro-valve for radiation floors, as well as presence detectors or window open detectors. All zones communicate between them and with the System Controller by means of a Local communication bus composed of 4 wires. (Read more details in the *InnoBUS Installation Manual*).



InnoBUS is a totally autonomous system, which can be controlled from the own system's thermostats (they incorporate integrated temperature sensor) without the need of any other added system. Also it incorporates a communication port from which a home automation system can supervise and control every parameter of the home climatization zones in a bi-directional way, being reflected the orders given from the home automation system in the system's thermostats. This port is used in this case to connect to the IntesisBox KNX-Airzone InnoBUS.

This communication port is RS485, which means that is possible to connect more than one System Controller (CS) in bus to a single IntesisBox KNX.

The number of systems that can be accessed through the IntesisBox KNX - Airzone InnoBUS, if using the standard version, is 4 system controllers (CS) and 32 zones (CL) per system. (In case you need to integrate bigger systems contact AIRZONE)



1.2 Signals available

The signals (communication objects) available per every **System Controller** (CS) are:

Signal Name	Data Type EIS	Read/Write
Communication Error CS 0-> Normal 1-> Indicates comm. error with the CS	1 - Switching (1 bit)	Read
Operation Mode of the Machine 0-Stop, 1-Cold, 2-Heat, 3-Ventilation, 4-Heat+	14 - Counter (8 bit)	Read/Write
Mode STOP	1 - Switching (1 bit)	Read/Write
Mode COLD	1 - Switching (1 bit)	Read/Write
Mode HEAT	1 - Switching (1 bit)	Read/Write
Mode VENTILATION	1 - Switching (1 bit)	Read/Write
Mode HEAT+	1 - Switching (1 bit)	Read/Write
Differential setpoint Radiation Floor Cold	5 - Float (16 bit)	Read/Write
Differential setpoint Radiation Floor Heat	5 - Float (16 bit)	Read/Write
Timer protection anti-shortcycle 0-> 10 seconds 1-> 04 Minutes	1 - Switching (1 bit)	Read/Write
Mode Permanent Ventilation 0-> Ventilation Automatic (only on demand) 1-> Ventilation Continuous	1 - Switching (1 bit)	Read/Write
Summer Protection Return Temperature 0-> 06 °C 1-> 08 °C 2-> 10 °C 3-> 12 °C	14 - Counter (8 bit)	Read/Write
Winter Protection Return Temperature 0-> 32 °C 1-> 34 °C 2-> 36 °C 3-> 38 °C	14 - Counter (8 bit)	Read/Write
Mode close of last grid 0-> Close with no delay 1-> Close with delay of 60 seconds	1 - Switching (1 bit)	Read/Write
Machine 1 or 2 steps 0-> Machine 1 Step 1-> Machine 2 Steps	1 - Switching (1 bit)	Read/Write
Mode heat + global 0-> Mode Heat+ global not enabled 1-> Mode Heat+ global enabled	1 - Switching (1 bit)	Read/Write
Machine Configuration local/remote 0 -> Local Configuration (Switches in board CS) 1 -> Remote Configuration (MODBUS)	1 - Switching (1 bit)	Read/Write
Return Temperature	5 - Float (16 bit)	Read

Impulsion Temperature	5 - Float (16 bit)	Read
Outdoor Temperature	5 - Float (16 bit)	Read
Boiler Temperature	5 - Float (16 bit)	Read
Fire Alarm 0-> Normal 1-> Alarm	1 - Switching (1 bit)	Read
Machine Start/Stop status Indicator 0-> Stop 1-> Start	1 - Switching (1 bit)	Read
Floor relay status - zone 1..32 0-> Stop 1-> Start	1 - Switching (1 bit)	Read

The signals (communication objects) available per every **Zone** (CL) are:

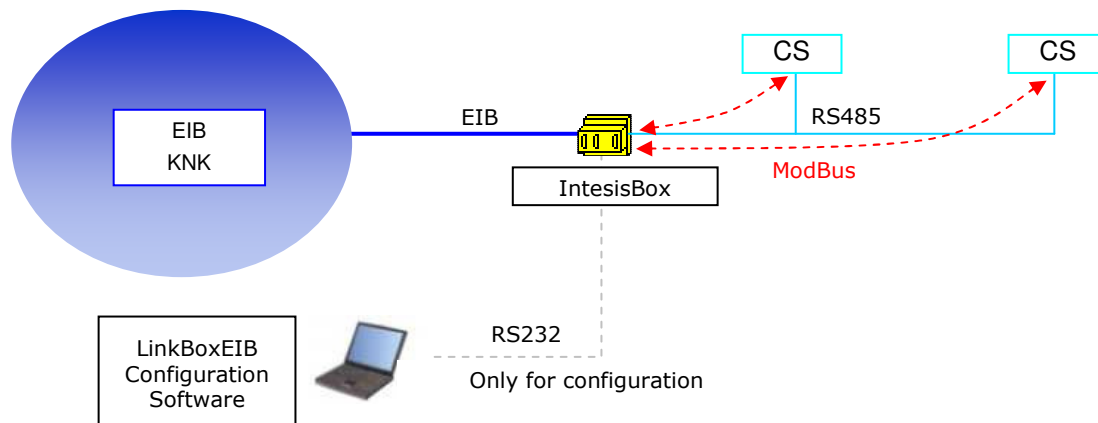
Signal Name	Data Type EIS	Read/Write
Communication Error ZN 0-> Normal 1-> Indicates comm. error with the CL	1 - Switching (1 bit)	Read
Mode Zone 0-Comfort, 1-Eco	14 - Counter (8 bit)	Read/Write
Mode COMFORT Zone	1 - Switching (1 bit)	Read/Write
Mode ECO Zone (A variation of 0.5°/30 min. is allowed with a maximum of 2°)	1 - Switching (1 bit)	Read/Write
OFF/ON Zone 0-> OFF 1-> ON	1 - Switching (1 bit)	Read/Write
Hold Zone 0 -> Hold Zone inactive (push button/touchscreen in the thermostat are operative) 1 -> Hold Zone active (push button/touchscreen in the thermostat are not operative)	1 - Switching (1 bit)	Read/Write
Minimum value for Temp. setpoint in the Zone	5 - Float (16 bit)	Read/Write
Maximum value for Temp. setpoint in the Zone	5 - Float (16 bit)	Read/Write
Temperature setpoint	5 - Float (16 bit)	Read/Write
Master/Zone Thermostat 0 -> ZoneThermostat 1 -> Master Thermostat (allows to change the Mode of the whole system)	1 - Switching (1 bit)	Read/Write
Zone Air Conditioner enable 0 -> Zone Air Conditioner disabled 1 -> Zone Air Conditioner enabled	1 - Switching (1 bit)	Read/Write
Zone Radiation Floor enable 0 -> Zone Radiation Floor disabled 1 -> Zone Radiation Floor enabled	1 - Switching (1 bit)	Read/Write
Master Radiation Floor enable 0 -> Master Radiation Floor disabled	1 - Switching (1 bit)	Read/Write

1 -> Master Radiation Floor enabled (1) This bit will only be valid when the thermostat is also master		
Grid opening angle 0 -> Opening angle 90 ° 1 -> Opening angle 50 ° 2 -> Opening angle 45 ° 3 -> Opening angle 40 ° (1) Only used in mode Heat or Heat+, in mode Cold or Ventilation will always open at 90°	14 - Counter (8 bit)	Read/Write
Minutes grid open Amount of time in which the grid was open in the zone, since the last reset of the register, in fractions of 10 minutes (1=10 m, 5=50 m, 15=150 m, etc...)	10 - Counter (16 bit)	Read/Write
Master Zone Direction 0 -> This zone is the master n -> Direction of the master zone	14 - Counter (8 bit)	Read/Write
Zone grid open 0 -> Zone grid closed 1 -> Zone grid opened	1 - Switching (1 bit)	Read
Zone master/slave 0 -> Zone Master (with thermostat) 1 -> Zone Slave (without thermostat)	1 - Switching (1 bit)	Read
Battery Low in the thermostat 0 -> Battery Ok in the Thermostat 1 -> Battery Low in the Thermostat	1 - Switching (1 bit)	Read
Thermostat connected to Zone Module 0 -> Thermostat not connected to zone module 1 -> Thermostat connected to zone module	1 - Switching (1 bit)	Read
Local Temperature of the zone	5 - Float (16 bit)	Read

To obtain more detailed information about the meaning of every signal consults the documentation of the Airzone InnoBUS system or contact Airzone.

1.3 Functionality

Every one of the mentioned signals must be associated, at least, to one *KNX group address*, with this, all the InnoBUS system is seen as *one more KNX device* from the KNX system point of view, with the same configuration and operation characteristics.



IntesisBox reads continuously the points configured of the System Controllers (CS) and Zones, and updates in its memory all the values received from the InnoBUS system to serve them to the KNX system.

When a point changes in the InnoBUS system, a write telegram is sent to the KNX bus, of the *KNX Group* associated.

When a write telegram is received from the KNX bus, of a *KNX Group* associated to an InnoBUS point, the corresponding message is sent to InnoBUS to perform the corresponding action in the system.

In the continuous polling process of the System Controllers, if a communication error is detected, because the CS is not responding, it is indicated with a *communication error* virtual signal. The same way there is a communication error virtual signal for every Zone. *Remember that, the variables of the Zones installed in the systems of the installation, must be configured.*

1.4 Capacity of IntesisBox

The basic model of IntesisBox KNX - Airzone InnoBUS has the following maximum capacity:

Element	Max.	Notes
System Controllers	4	Maximum number of system controllers supported
Zones: Nr. of System Controllers x 32	128	Maximum number of zones supported
KNX Groups	2000	Total number of KNX Groups that can be used in IntesisBox.
Listening addresses	1000	Total number of KNX Groups that can be used as listening addresses.
Listening addresses per KNX Group.	255	Total number of listening addresses that can be associated to a KNX Group.

In case you need to integrate a bigger InnoBUS installation contact AIRZONE.

Ref.: IBOX-KNX-AIRZONE

2. KNX System

In this section, a common description for all IntesisBox KNX series gateways is given, from the point of view of KNX system which is called from now on *internal system*. The InnoBUS system is also called from now on *external system*.

2.1 Description

IntesisBox KNX connects directly to the KNX TP-1 (EIB) bus and behaves as one more devices into the KNX system, with the same configuration and operational characteristics as other KNX devices.

Internally, the circuit part connected to the KNX bus is opto-isolated from the rest of the electronics.

IntesisBox KNX receives, manages and sends all the telegrams related to its configuration to the KNX bus.

On receiving telegrams of KNX Groups associated to the external system (InnoBUS in this case), the corresponding messages are sent to the external system to maintain both systems synchronised in every moment.

When a change in a signal of the external system is detected, a telegram is sent to the KNX bus (of the associated KNX group) to maintain both systems synchronised in every moment.

The status of the KNX bus is checked continuously and, if a bus drop down is detected, due to a failure in the bus power supply for example, when the KNX bus is restored again, IntesisBox will retransmit the status of all the KNX groups marked as "*T*" *Transmit*. Also the *Updates* of the groups marked as "*U*" *Update* will be performed. The behaviour of IntesisBox for every point is determined by the flags configured per every point. See details in section 3.

2.2 Points definition

Every signal of the external system (InnoBUS) to use has the following KNX properties:

Property	Description
Signal	Signal's Description. Only for informative purposes, allows identifying the signal comfortably.
EIS (DataPoint)	It's the KNX data type used to code the signal's value. It will depend on the type of signal associated in the external system in every case. In some integration it is selectable, in others it is fixed due to the intrinsic characteristics of the signal.
Group	It's the KNX group to which the signal is associated. It is also the group to which the read (R), write (W), transmit (T) and update (U) flags are applied. Is the sending group.
Listening addresses	They are the addresses that will actuate on the signal, apart of the Group address.
R	Read flag. If activated, read telegrams of this group will be allowed.
W	Write flag. If activated, write telegrams of this group will be allowed.
T	Transmit flag. If activated, when the signal's value changes, due to a change in the external system, a write telegram of the group will be sent to the KNX bus.
U	Update flag. If activated, on IntesisBox start-up or after a KNX bus reset detection, read telegrams of the sending group will be sent to the KNX bus, and the value received will be sent to the external system as if it has been received by a write telegram.
Active	If activated, the signal will be active in IntesisBox, if not, the behaviour will be as if the signal is not defined. Allows deactivating signals without the need of delete them for possible future use.

These properties are common for all IntesisBox KNX series gateways, although every integration may have specific properties according to the type of signals of the external system in every case.

3. LinkBoxEIB. Configuration & monitoring tool for IntesisBox KNX series

3.1 Introduction

LinkBoxEIB is a Windows compatible software tool developed specifically to monitor and configure IntesisBox KNX series gateways. It is possible to configure all external protocols available for IntesisBox KNX and to maintain different customer's configurations based on a LinkBoxEIB project for every different installation. Maintaining always on hard disk a copy of the last configuration files for every external protocol and customer, that is to say for every project.

From LinkBoxEIB, as well as configure the integration signals list and connection parameters for every external protocol, it is permitted also to select the serial port to use to connect to IntesisBox and the use of some tools for monitoring and debugging the device. Some of these tools will be explained in this document but only some of them, the rest of available debugging tools and commands will not be explained here because they are for exclusive use under the recommendations of Intesis Software technical support.

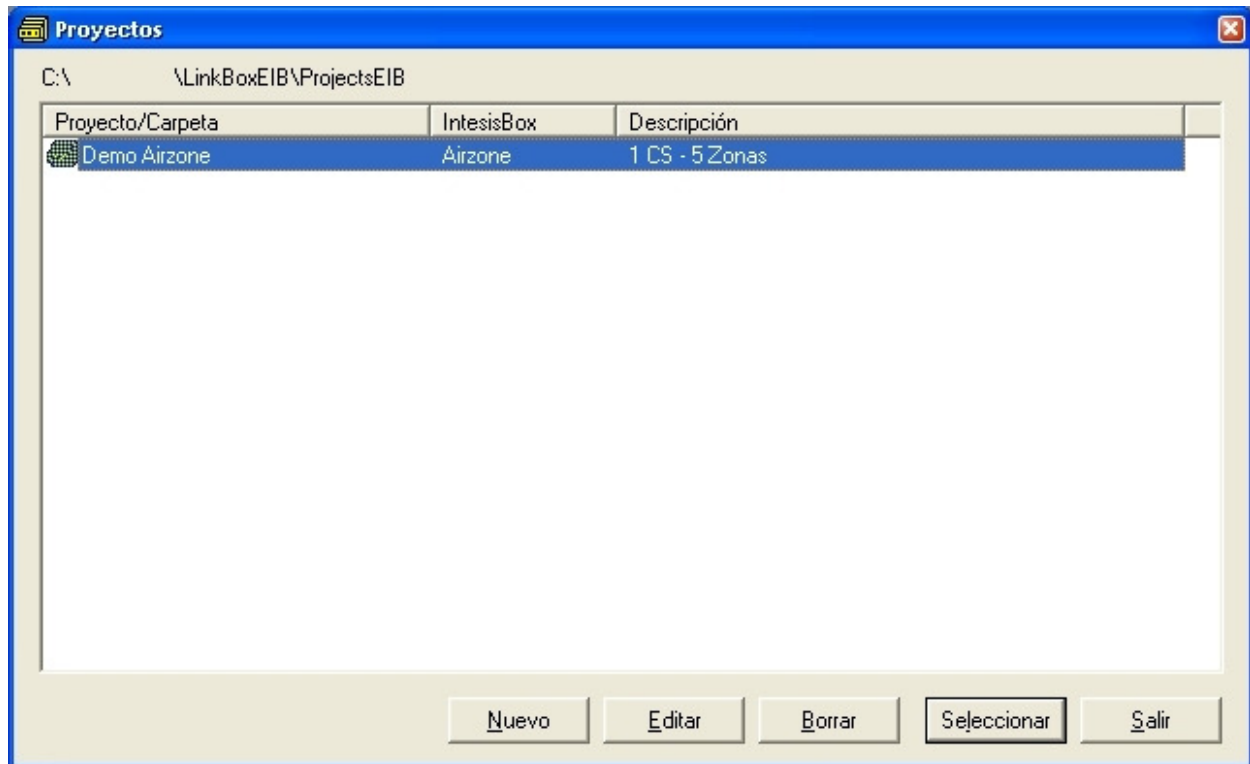
LinkBoxEIB allows configuring all IntesisBox KNX series independently of the external system or protocol used. For every external system, LinkBoxEIB has a specific configuration window. Periodically, new free versions of LinkBoxEIB are released incorporating the latest developed integrations for external systems.

3.2 Project definition

The first step to do in LinkBoxEIB for a new installation is to create the installation project giving a descriptive name to it. When you create a project, a new folder is created with the name of the project containing the configuration files needed depending on the external protocol selected for the project. It is strongly recommended that you create a new project for every installation, if not, overwriting of configuration files of previous installations using the same external protocol may occur, losing the configuration data for those previous installations. The projects folder is located in AppFolder\ProjectsEIB, where AppFolder is the installation folder of LinkBoxEIB (by default C:\Program Files\Intesis\LinkBoxEIB). Inside the projects folder, a new folder will be created for every project defined in LinkBoxEIB with the files needed for the project.

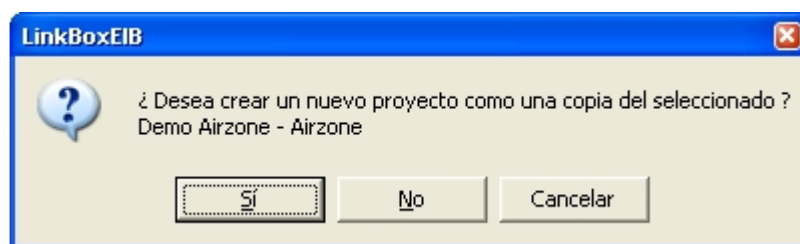
When you open LinkBoxEIB, the project selection window will appear inviting you to select a project or to create a new one. A demo project for every external protocol supported is provided with the standard installation of LinkBoxEIB.

You can create a brand new project, which will create a blank project (only basic parameters will be already configured), or you can select a demo project based on the external protocol desired and create a new project based on this demo project selected (all the configuration of the demo project will be copied into the new project created).



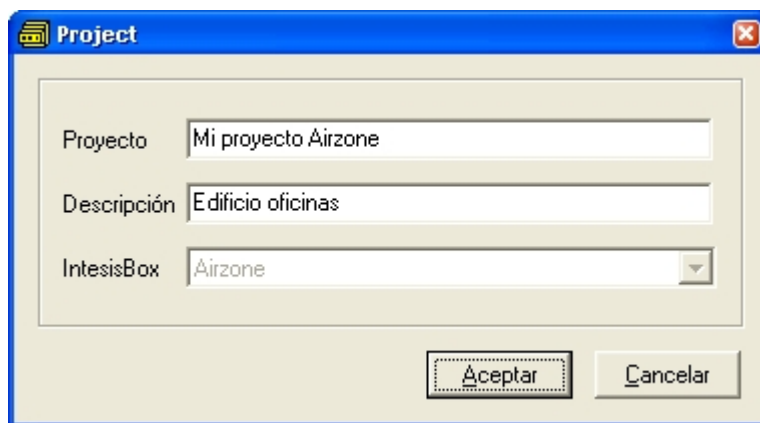
Project selection window

To create a new project, select a project using the same external protocol you want to use in the new project and push *New* button. You will be prompted to create a copy of the selected project (useful for similar installations) or create a brand new one.



If you select *Yes*, you will be prompted to specify a name and a description for the new project that will contain a copy of the configuration of the selected one.

If you select *No*, you can specify a name, a description and an external protocol to use from the list of available external protocols. This will create a brand new project based in the external protocol specified.

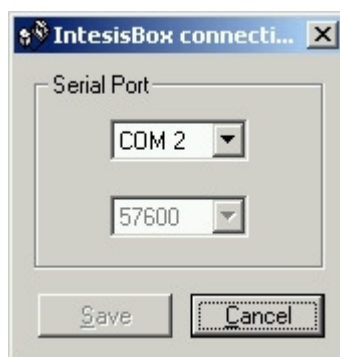


On *Accept*, a new folder will be created inside the projects folder with the name given to the project, this folder will contain the template configuration files if the project is a brand new one, or a copy of the configuration files if it is a copy of a selected one.

A description of the files created for an InnoBUS protocol based project can be found in section *Files* below in this document.

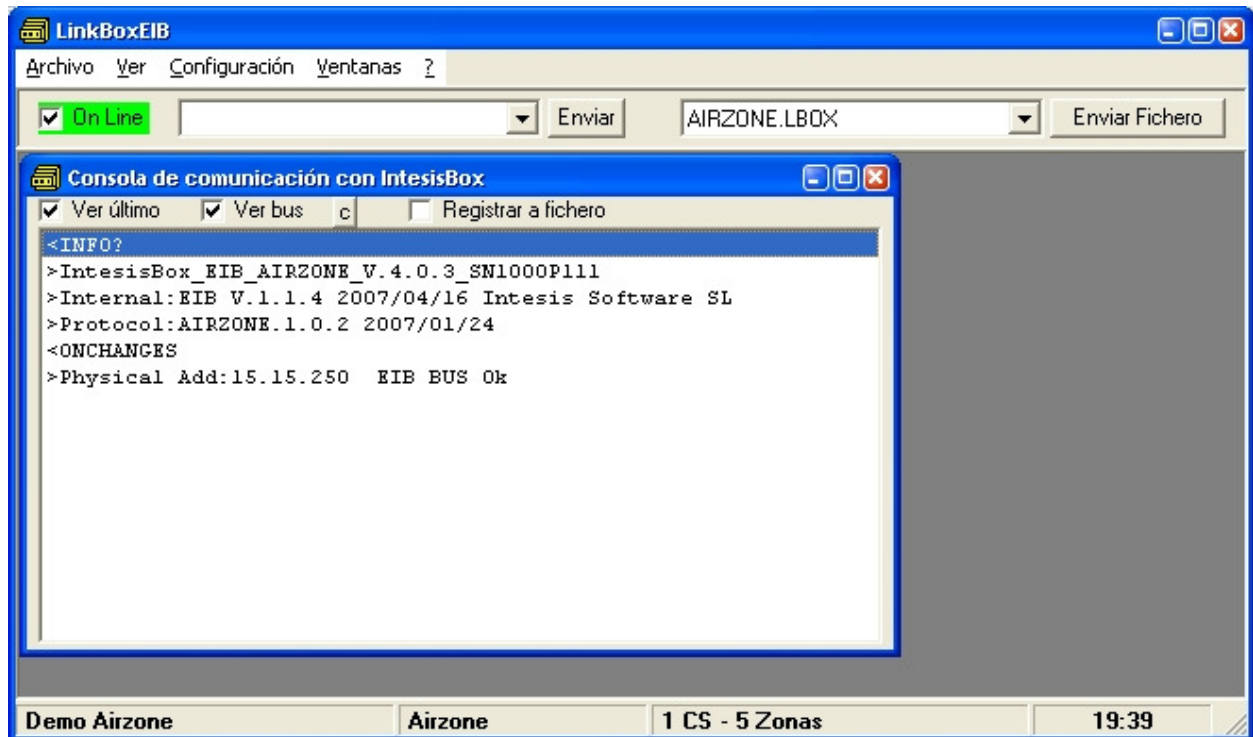
From all the possibilities of LinkBoxEIB, only changes in configuration for the integration and configuration file generation can be performed while disconnected from IntesisBox (working off-line), allowing you to do these tasks more comfortably in the office. Before any monitoring or downloading action to IntesisBox can be performed, the connection between IntesisBox and the PC running LinkBoxEIB must be established (working on-line). To do so follow these steps:

1. Make sure IntesisBox is powered-up a correctly connected to the KNX system via the EIB bus and to the InnoBUS system via the RS485 connection (consults details for connection and pin assignments in section *Connections* of this document).
2. Connect a free PC serial port to IntesisBox's serial port marked as **PC Console**. (Use the standard serial cable supplied with IntesisBox or makes your own cable following the pin assignments specified in section *Connections* in this document). You can use an USB-RS232 converter if your PC has not COM ports.
3. Select in LinkBoxEIB the PC serial port used for the connection to IntesisBox. Use menu Configuration -> Connection.



4. Check the checkbox *off-line* under the menu bar (it will change automatically to *on-line*) and LinkBoxEIB will ask for INFO about the IntesisBox connected to it via the serial connection, if the connection is ok then IntesisBox will respond with its identification

(this can be monitored in the *IntesisBox Communication Console* window, as showed below).

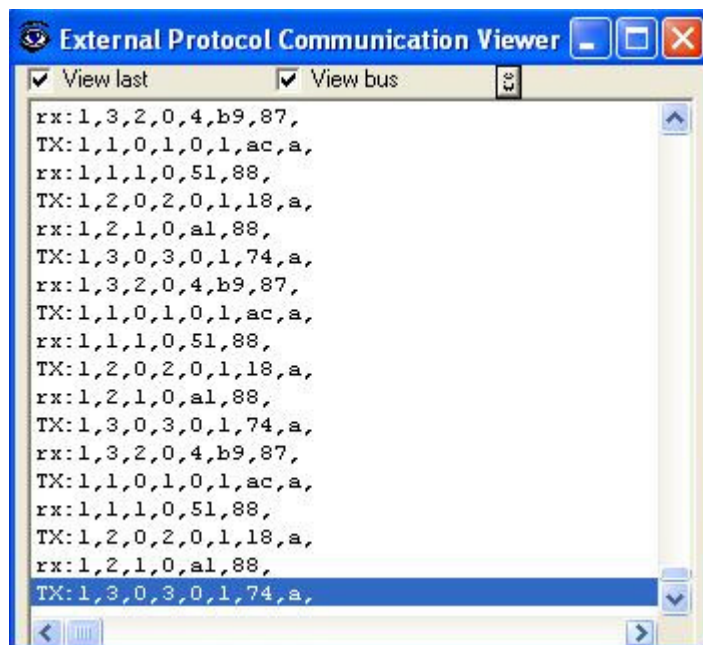


Once connected to IntesisBox, all the options of LinkBoxEIB are fully operative.

To monitor the communication between IntesisBox and the KNX system, select the menu *View -> Bus -> EIB*. The *EIB communication Viewer* window will be opened. This window shows in real time all the communication frames between IntesisBox and the KNX system as well as debugging messages referent to the internal protocol (KNX) sent by IntesisBox.



To monitor the communication between IntesisBox and the external system (*InnoBUS* in this case), select the menu *View -> Bus -> External system*. The *External protocol communication viewer* window will be opened. This window shows in real time all the communication frames between IntesisBox and the InnoBUS CS devices as well as debugging messages referent to external protocol sent by IntesisBox.



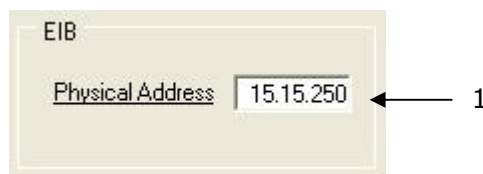
To configure the integration connection parameters, and the points list, select menu *Configuration -> IntesisBox*. The *Airzone Configuration* window will be opened.

3.3 Connection configuration

Select the Connection tab to configure the connection parameters.

Two kinds of information are configured using this window: the parameters of the KNX interface, and the parameters of the InnoBUS interface.

KNX interface configuration parameters:

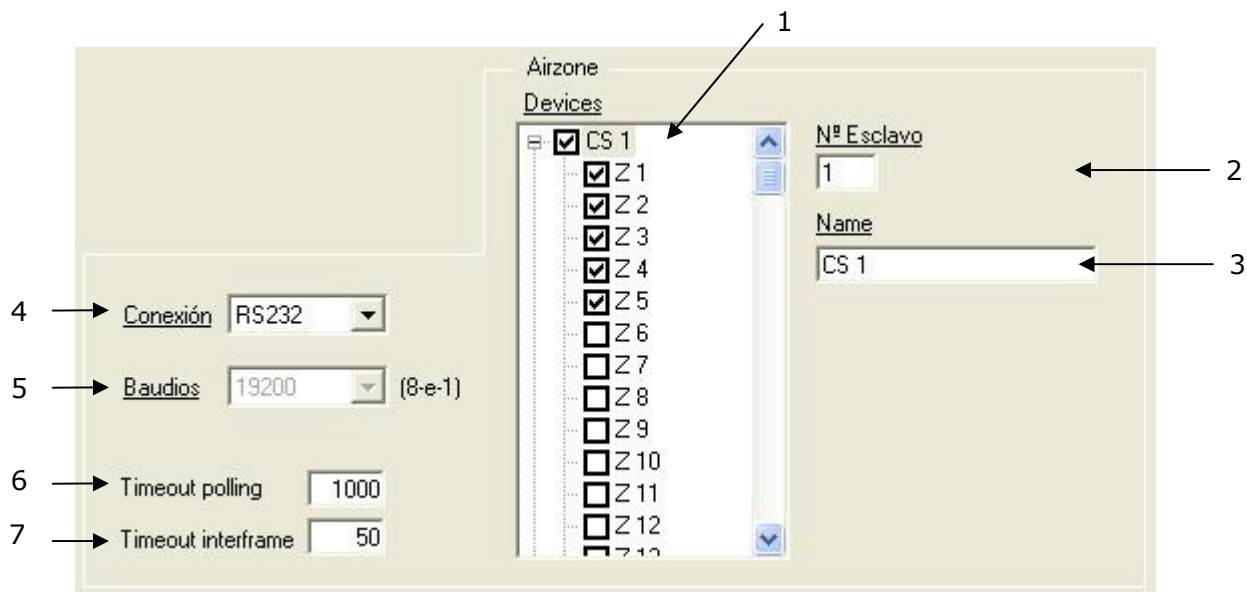


The screenshot shows a configuration window titled 'EIB'. Inside, there is a label 'Physical Address' followed by a text input field containing the value '15.15.250'. An arrow labeled with the number '1' points to this input field.

KNX configuration

1. Enter the physical address desired for IntesisBox inside the KNX network.

InnoBUS interface configuration parameters:



The architecture of the Airzone installation must be indicated to the IntesisBox, for this, in the tree of this window (1), select the CS's and Zones present in the installation.

1. List of System Controllers (CS) and their respective Zones. Only those really existing in your installation must be selected, if they are not selected here you will not be able to configure their points later. Every device has the following properties:

2. In the case of the System Controllers (CS), is the ModBus slave number, must coincide with the number really configured in the CS, (by default 1).

3. Descriptive name of the device, optional.

4. IntesisBox has 2 ports, RS232 and RS485, select always RS485.

5. Baud rate used for the communication. Fixed at 19200 bps.

6. Waiting time (in ms) for a response of the InnoBUS, when this time is elapsed without a response, the communication error signal for the corresponding CS is activated.

7. Time (in ms) between InnoBUS frames, do not modify.

3.4 Signals configuration

Select the Signals tab to configure the points list (the IntesisBox's internal points).

	CS	Zona	Cod	Señal	EIS	Grupo	Direcciones de escucha	R	W	T	U	Activa
1	1	-	0	Error comunicación CS	1 - Switching (1 bit)			R		T		0-No
2	1	-	1	Modo operación Máquina	14 - Counter (8 bit)			R	W	T		0-No
3	1	-	100	STOP Máquina (0)	1 - Switching (1 bit)	1/4/1		R	W	T		1-Si
4	1	-	101	FRIIO Máquina (1)	1 - Switching (1 bit)	1/4/2		R	W	T		1-Si
5	1	-	102	CALOR Máquina (2)	1 - Switching (1 bit)	1/4/3		R	W	T		0-No
6	1	-	103	VENTILACION Máquina (3)	1 - Switching (1 bit)			R	W	T		0-No
7	1	-	104	CALOR+ Máquina (4)	1 - Switching (1 bit)	1/4/5		R	W	T		1-Si
18	1	-	12	Temperatura sonda retorno	5 - Float (16 bit)			R		T		0-No
19	1	-	13	Temperatura sonda impulsión	5 - Float (16 bit)			R		T		0-No
20	1	-	14	Temperatura sonda exterior	5 - Float (16 bit)			R		T		0-No
21	1	-	15	Temperatura sonda caldera	5 - Float (16 bit)			R		T		0-No
56	1	1	0	Error comunicación ZN	1 - Switching (1 bit)			R		T		0-No
57	1	1	1	Modo Zona	14 - Counter (8 bit)			R	W	T		0-No
58	1	1	100	CONFORT Zona (0)	1 - Switching (1 bit)	1/4/18		R	W	T		1-Si
59	1	1	101	ECO Zona (1)	1 - Switching (1 bit)	1/4/19		R	W	T		1-Si
61	1	1	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/21		R	W	T		1-Si
62	1	1	3	Hold Zona	1 - Switching (1 bit)			R	W	T		0-No
63	1	1	4	Valor mínimo consigna	5 - Float (16 bit)			R	W	T		0-No
64	1	1	5	Valor máximo consigna	5 - Float (16 bit)			R	W	T		0-No
65	1	1	6	Temperatura consigna	5 - Float (16 bit)	1/4/24		R	W	T		1-Si
70	1	1	11	Angulo apertura rejilla	14 - Counter (8 bit)			R	W	T		0-No
82	1	1	23	Temperatura local de la zona	5 - Float (16 bit)	1/4/30		R		T		1-Si
83	1	2	0	Error comunicación ZN	1 - Switching (1 bit)			R		T		0-No
84	1	2	1	Modo Zona	14 - Counter (8 bit)			R	W	T		0-No
85	1	2	100	CONFORT Zona (0)	1 - Switching (1 bit)	1/4/33		R	W	T		1-Si
86	1	2	101	ECO Zona (1)	1 - Switching (1 bit)	1/4/34		R	W	T		1-Si
88	1	2	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/36		R	W	T		1-Si

Points list

- Indicates the properties to show in the grid, depending on the functionality desired: with **Normal** only those properties of normal use are showed, and with **Extended** all advanced properties are also showed (highlighted in green colour).
- #. Signal's number (edit not permitted). Every row in the grid corresponds to a signal (point). This column is used only to enumerate the rows in the grid (signals).
- CS. System Controller number to which belongs the point. Referenced to the list of CSs defined in *Connection Tab*. Note that this is not the slave number configured in the CS device itself, it is just the order of the CS (from top to bottom) in the tree.
- Zone. Zone number to which belongs the point. For properties of CSs just "-" is showed. Not editable.
- Cod. Is an internal number identifier. Not editable. In the fields in orange colour, a right-button-click menu is available.
- Signal. Descriptive name of the point (optional). Identifies the point at user level. This description corresponds with the code. Not editable. In the fields in orange colour, a right-button-click menu is available.

6. *EIS*. Is the EIS type (Data point) EIB, format used to code the point's value in the KNX protocol. A right-button-click menu is available showing all the possible types. Not editable.
7. *Group*. Main EIB group address for the signal. Format: P/I/S or P/S. Flags *R,W,T,U* explained below will only apply for this main EIB group address, not for listening addresses (if defined). Is the sending group address.
8. *Listening addresses*. EIB group addresses that will be listen by IntesisBox for this signal, that is to say, if IntesisBox receives an EIB telegram with destination one of these listening addresses, then the telegram will be taken into account and the corresponding action will be performed on this signal. Format: P/I/S or P/S, if more than one is entered then they must be separated by comma.
9. *R*. Indicates if this signal is allowed to be read from KNX system. Possible values: "R" or blank. "R" means flag activated. Edit using the mouse right-button-click pop-up menu available on the column. Freely configurable, but be careful (see below).
10. *W*. Indicates if this signal is allowed to be written from KNX system. Possible values: "W" or blank. "W" means flag activated. Edit using the mouse right-button-click pop-up menu available on the column. Freely configurable, but be careful (see below).
11. *T*. Indicates if this signal will generate a telegram sending to the KNX system following a change of the signal's value, that is to say, any change of value of this signal received from the InnoBUS system will be transmitted to the KNX system if this flag is activated. Possible values: "T" or blank. "T" means flag activated. Edit using the mouse right-button-click pop-up menu available on the column. Freely configurable, but be careful (see below).
12. *U*. Indicates if this signal will be updated whenever IntesisBox starts up or after an EIB bus reset. "U" means flag activated for the main EIB group address (a read of the main EIB group address will be performed in the KNX system for the update). "U2" means flag activated for the first listening address defined (a read of the first listening address defined for the point will be performed in the KNX system for the update). Blank means flag not activated. Edit using the mouse right-button-click pop-up menu available on the column. Freely configurable, but be careful (see below).
13. *Active*. Indicates if the signal is active or not for the integration. Possible values: 0-No, 1-Yes. Edit using the mouse right-button-click menu available on the column.

Columns *R*, *W*, *T*, *U* and *Active* can be modified, with double-click on the cell, selecting one or some consecutive cells on the column and using the contextual menu that appears with the right button of the mouse, or pressing the first letter of the word on the keyboard.

Flags *R*, *W*, *T*, and *U* contain the correct values by default for a successful integration, do not modify their values if you are not sure on how it will affect the integration.

Some cells in the column *Code* and *Signal* are showed in orange colour, using the contextual menu available with the right button of the mouse you can *Show/Hide* the *Selection* or *All*.



If you select *Show/Hide Selection*, new points appear/disappear. These new points are the signals called *Multibit*, and have the following utility. There are signals who can vary between a reduced number of values, for example 0-1-2-3-4, this type of signals can be managed using EIS6 (Value 8bits), but could be necessary or convenient manage them using simpler objects as for example a switch EIS1 (switching). The new signals that appear

highlighted in yellow colour allow managing a concrete value of the parent signal using an EIS1. Show/Hide *Selection* also can be done by double-click on the orange cells.

Show/Hide *All* affects to all the orange cells on the grid. Even though the multibit signals are showed, they will not be used by IntesisBox until they are activated (column *Active: 1-Yes*).

The following figure shows the grid with Multibit signals hide.

Configuración Airzone - Max.GruposEIB:2000 - Max.Dirs.escuchaEIB:1000 - Max.Dirs.escucha/GrupoEIB:255

Conexión Señales

Normal Propiedades

	CS	Zona	Cod	Señal	EIS	Grupo	Direcciones de escucha	R	W	T	U	Activa
1	1	-	0	Error comunicación CS	1 - Switching (1 bit)			R		T		0-No
2	1	-	1	Modo operación Máquina	14 - Counter (8 bit)			R	W	T		0-No
18	1	-	12	Temperatura sonda retorno	5 - Float (16 bit)			R		T		0-No
19	1	-	13	Temperatura sonda impulsión	5 - Float (16 bit)			R		T		0-No
20	1	-	14	Temperatura sonda exterior	5 - Float (16 bit)			R		T		0-No
21	1	-	15	Temperatura sonda caldera	5 - Float (16 bit)			R		T		0-No
56	1	1	0	Error comunicación ZN	1 - Switching (1 bit)			R		T		0-No
57	1	1	1	Modo Zona	14 - Counter (8 bit)			R	W	T		0-No
61	1	1	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/21		R	W	T		1-Si
62	1	1	3	Hold Zona	1 - Switching (1 bit)			R	W	T		0-No
63	1	1	4	Valor mínimo consigna	5 - Float (16 bit)			R	W	T		0-No
64	1	1	5	Valor máximo consigna	5 - Float (16 bit)			R	W	T		0-No
65	1	1	6	Temperatura consigna	5 - Float (16 bit)	1/4/24		R	W	T		1-Si
70	1	1	11	Angulo apertura rejilla	14 - Counter (8 bit)			R	W	T		0-No
82	1	1	23	Temperatura local de la zona	5 - Float (16 bit)	1/4/30		R		T		1-Si
83	1	2	0	Error comunicación ZN	1 - Switching (1 bit)			R		T		0-No
84	1	2	1	Modo Zona	14 - Counter (8 bit)			R	W	T		0-No
88	1	2	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/36		R	W	T		1-Si
89	1	2	3	Hold Zona	1 - Switching (1 bit)			R	W	T		0-No
90	1	2	4	Valor mínimo consigna	5 - Float (16 bit)			R	W	T		0-No
91	1	2	5	Valor máximo consigna	5 - Float (16 bit)			R	W	T		0-No
92	1	2	6	Temperatura consigna	5 - Float (16 bit)	1/4/39		R	W	T		1-Si

Nombre de la señal a integrar. Está relacionada con el Código.

Aceptar Salir

The following figure shows the grid with Multibit signals showed.

Configuración Airzone - Max.GruposEIB:2000 - Max.Dirs.escuchaEIB:1000 - Max.Dirs.escucha/GrupoEIB:255

Conexión Señales

Normal Propiedades

	CS	Zona	Cod	Señal	EIS	Grupo	Direcciones de escucha	R	W	T	U	Activa
1	1	-	0	Error comunicación CS	1 - Switching (1 bit)			R		T		0-No
2	1	-	1	Modo operación Máquina	14 - Counter (8 bit)			R	W	T		0-No
3	1	-	100	STOP Máquina (0)	1 - Switching (1 bit)	1/4/1		R	W	T		1-Si
4	1	-	101	FRIQ Máquina (1)	1 - Switching (1 bit)	1/4/2		R	W	T		1-Si
5	1	-	102	CALOR Máquina (2)	1 - Switching (1 bit)	1/4/3		R	W	T		0-No
6	1	-	103	VENTILACION Máquina (3)	1 - Switching (1 bit)			R	W	T		0-No
7	1	-	104	CALOR+ Máquina (4)	1 - Switching (1 bit)	1/4/5		R	W	T		1-Si
18	1	-	12	Temperatura sonda retorno	5 - Float (16 bit)			R		T		0-No
19	1	-	13	Temperatura sonda impulsión	5 - Float (16 bit)			R		T		0-No
20	1	-	14	Temperatura sonda exterior	5 - Float (16 bit)			R		T		0-No
21	1	-	15	Temperatura sonda caldera	5 - Float (16 bit)			R		T		0-No
56	1	1	0	Error comunicación ZN	1 - Switching (1 bit)			R		T		0-No
57	1	1	1	Modo Zona	14 - Counter (8 bit)			R	W	T		0-No
58	1	1	100	CONFORT Zona (0)	1 - Switching (1 bit)	1/4/18		R	W	T		1-Si
59	1	1	101	ECO Zona (1)	1 - Switching (1 bit)	1/4/19		R	W	T		1-Si
61	1	1	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/21		R	W	T		1-Si
62	1	1	3	Hold Zona	1 - Switching (1 bit)			R	W	T		0-No
63	1	1	4	Valor mínimo consigna	5 - Float (16 bit)			R	W	T		0-No
64	1	1	5	Valor máximo consigna	5 - Float (16 bit)			R	W	T		0-No
65	1	1	6	Temperatura consigna	5 - Float (16 bit)	1/4/24		R	W	T		1-Si
70	1	1	11	Angulo apertura rejilla	14 - Counter (8 bit)			R	W	T		0-No
99	1	1	22	Temperatura local de la zona	5 - Float (16 bit)	1/4/20		R		T		1-Si

Configuración de las señales a integrar

Aceptar Salir

By default, all the Multibit signals are showed, if you are not going to use them is more comfortable to work with them hidden (*Hide-All*).

The following figure shows the grid with **extended** signals showed, they are normally hidden. Even though they are hidden, they will be active for IntesisBox if they have been activated.

Configuración Airzone - Max.GruposEIB:2000 - Max.Dirs.escuchaEIB:1000 - Max.Dirs.escucha/GrupoEIB:255

Conexión Señales

Extendidas Propiedades

	CS	Zona	Cod	Señal	EIS	Grupo	Direcciones de escucha	R	W	T	U	Activa
54	1	-	48	Estado relé suelo zona 31	1 - Switching (1 bit)			R		T		0-No
55	1	-	49	Estado relé suelo zona 32	1 - Switching (1 bit)			R		T		0-No
56	1	1	0	Error comunicación ZN	1 - Switching (1 bit)			R		T		0-No
57	1	1	1	Modo Zona	14 - Counter (8 bit)			R	W	T		0-No
61	1	1	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/21		R	W	T		1-Si
62	1	1	3	Hold Zona	1 - Switching (1 bit)			R	W	T		0-No
63	1	1	4	Valor mínimo consigna	5 - Float (16 bit)			R	W	T		0-No
64	1	1	5	Valor máximo consigna	5 - Float (16 bit)			R	W	T		0-No
65	1	1	6	Temperatura consigna	5 - Float (16 bit)	1/4/24		R	W	T		1-Si
66	1	1	7	Termostato Maestro/Zona	1 - Switching (1 bit)			R	W	T		0-No
67	1	1	8	Habilitación A.A. Zona	1 - Switching (1 bit)			R	W	T		0-No
68	1	1	9	Habilitación suelo radiante Zona	1 - Switching (1 bit)			R	W	T		0-No
69	1	1	10	Habilitación suelo radiante Maestro	1 - Switching (1 bit)			R	W	T		0-No
70	1	1	11	Angulo apertura rejilla	14 - Counter (8 bit)			R	W	T		0-No
71	1	1	12	Minutos rejilla abierta	10 - Counter (16 bit)			R	W	T		0-No
72	1	1	13	Dirección Zona Maestra	14 - Counter (8 bit)			R	W	T		0-No
73	1	1	14	Rejilla zona abierta	1 - Switching (1 bit)			R		T		0-No
76	1	1	17	Zona esclava/maestra	1 - Switching (1 bit)			R		T		0-No
77	1	1	18	Batería termostato baja	1 - Switching (1 bit)			R		T		0-No
81	1	1	22	Termostato conectado a Módulo CZ	1 - Switching (1 bit)			R		T		0-No
82	1	1	23	Temperatura local de la zona	5 - Float (16 bit)	1/4/30		R		T		1-Si
83	1	2	0	Error comunicación ZN	1 - Switching (1 bit)			R		T		0-No
84	1	2	1	Modo Zona	14 - Counter (8 bit)			R	W	T		0-No
88	1	2	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/36		R	W	T		1-Si

Nombre de la señal a integrar. Está relacionada con el Código.

Aceptar Salir

3.4.1 Remember

- If "T" is not activated, the changes in the InnoBUS system will not be transmitted to KNX the KNX.
- If "W" is not activated, no write on the group address could be done from KNX, neither on the links (listening addresses).
- If "U" is activated, after IntesisBox start-up or a KNX bus reset, READ Requests will be sent to KNX to update the sending group.
- If "U2" is activated, after IntesisBox start-up or a KNX bus reset, READ Requests of the first listening address defined will be sent to KNX to update the sending group.
- The groups defined as just links, will take the EIS of the first linked group.
- The data of the groups read from KNX due to read requests between other KNX devices, will be treated as writes on the groups (standard behaviour BCU1).
- The signals that are inputs to KNX must be configured as: T (mandatory), R (optional).
- The signals that are outputs from KNX must be configured as: W (mandatory), U (optional).
- The signals that are inputs/outputs to/from KNX must be configured as: W-T (mandatory), R-U (optional).
- Automatic type conversion is performed by IntesisBox, for example if an EIS5 is received by a group of type EIS1, then it is performed the conversion $EIS1=(EIS5<>0)$, or $EIS5=EIS9$ and $EIS9=EIS5$, $EIS6=EIS5(0..255)$, etc.
- It is recommended that listening addresses associated to different groups maintain the same EIS in all the groups, if not, none desired conversions can be performed.

- A write from KNX is propagated to the external system through the group address and also through the listening addresses.
- A write from the external system is NOT propagated to KNX through the listening addresses, but DO update the local sending groups that are used as listening addresses.
- If a sending group is used as listening address with other local sending groups, a write from the external system will update the sending group but not the listening addresses.
- In case of a KNX bus reset, if "UpdateOnResetoErrEIB" is activated in the file *Airzone.ini*. The groups configured as "U" or "U2" will be updated.
- After the start-up or after a KNX bus reset, the update of groups "U" and "U2" will be performed after the time (in seconds, by default 4) specified by "tS_DelayUpdateBus" in the file *Airzone.ini*.

3.4.2 Restrictions

- It is allowed group numbers in format P/I/S, P/S or directly the group number coded.
- It is not allowed duplicated sending groups (column Group).
- Group 0 is not allowed, it is used for signals without sending group.
- NO signal is allowed with none of R-W-T-U flags activated.
- Empty groups are allowed, but only if they have just W activated and one or more listening addresses.
- Duplicated groups in the same listening address field are not allowed.
- It is not allowed a listening address that is the same as the sending group (circular reference).
- Listening addresses are not allowed if the flag W is not activated. Without W activated, the listening addresses would not work.
- Only those EIS defined are allowed.

3.4.3 Conventions

- The multibit properties are executed only when you write 1, the written 0 remains in the sending Group but do nothing.
- If you write for example a set point temperature that is not accepted by Airzone, the value will be rejected by Airzone but will remain in IntesisBox.

3.5 Saving the configuration and sending it to IntesisBox

When the configuration is finished, click on button *Save* to save it to the project folder on hard disk. You will be prompted to generate the configuration file to send to IntesisBox, if you select *Yes*, the binary file containing the configuration for IntesisBox will be generated and saved also into the project folder.

Once the configuration has been saved and the configuration file for IntesisBox has been generated, to send this configuration file to IntesisBox, click on the button **Send File**. The process of file transmission can be monitored in the IntesisBox Communication Console window. If the file transmission is ok, IntesisBox will reboot automatically with the new configuration loaded.

3.6 Signals viewer

Once IntesisBox is running with the correct configuration, to supervise the status of the configured signals, select menu *View -> Signals*. The Signals Viewer window will be opened. This window shows all the active IntesisBox's signals with its main configuration parameters and its real time value in the column Value. After a reset of IntesisBox or after sending a configuration file to the IntesisBox, all the signal's values will be updated automatically in the signals viewer, in case you connect to the IntesisBox when it is already running, you should press the *Update* button to get updated values, press just once the button to update all the signal values, from this moment the signal values will be maintained updated until the connection is closed.

	CS	Zona	Cod	Señal	EIS	Grupo	Direcciones	R	W	T	U	Dato
1	1	0	100	STOP Máquina (0)	1 - Switching (1 bit)	1/4/1		R	W	T		0
2	1	0	101	FRIÓ Máquina (1)	1 - Switching (1 bit)	1/4/2		R	W	T		0
3	1	0	104	CALOR+ Máquina (4)	1 - Switching (1 bit)	1/4/5		R	W	T		0
4	1	1	100	CONFORT Zona (0)	1 - Switching (1 bit)	1/4/18		R	W	T		0
5	1	1	101	ECO Zona (1)	1 - Switching (1 bit)	1/4/19		R	W	T		0
6	1	1	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/21		R	W	T		0
7	1	1	6	Temperatura consigna	5 - Float (16 bit)	1/4/24		R	W	T		0
8	1	1	23	Temperatura local de la zona	5 - Float (16 bit)	1/4/30		R		T		0
9	1	2	100	CONFORT Zona (0)	1 - Switching (1 bit)	1/4/33		R	W	T		0
10	1	2	101	ECO Zona (1)	1 - Switching (1 bit)	1/4/34		R	W	T		0
11	1	2	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/36		R	W	T		0
12	1	2	6	Temperatura consigna	5 - Float (16 bit)	1/4/39		R	W	T		0
13	1	2	23	Temperatura local de la zona	5 - Float (16 bit)	1/4/45		R		T		0
14	1	3	100	CONFORT Zona (0)	1 - Switching (1 bit)	1/4/48		R	W	T		0
15	1	3	101	ECO Zona (1)	1 - Switching (1 bit)	1/4/49		R	W	T		0
16	1	3	2	OFF/ON Zona	1 - Switching (1 bit)	1/4/51		R	W	T		0
17	1	3	6	Temperatura consigna	5 - Float (16 bit)	1/4/54		R	W	T		0
18	1	3	23	Temperatura local de la zona	5 - Float (16 bit)	1/4/60		R		T		0
19	1	4	100	CONFORT Zona (0)	1 - Switching (1 bit)	1/4/62		R	W	T		0
20	1	4	101	ECO Zona (1)	1 - Switching (1 bit)	1/4/63		R	W	T		0

The signals viewer can be used although only one system is connected to the IntesisBox, *KNX* or *InnoBUS*, and is very useful for supervision and test.

It is possible to force a specific value to any signal for test purposes, to do so just double click on the row and select the desired value and Accept in the Data Test window. If the signal has T activated, its value will be updated and a telegram will be sent to *KNX* indicating the new value, the same way as if it has been received from *InnoBUS* system. If the signal has W activated, the new value entered will be sent to the external system, *InnoBUS* in this case, the same way as if it has been received from *KNX*.

Temperatura consigna

Grupo EIB:1/4/24 EIS:5 - Float (16 bit)

22

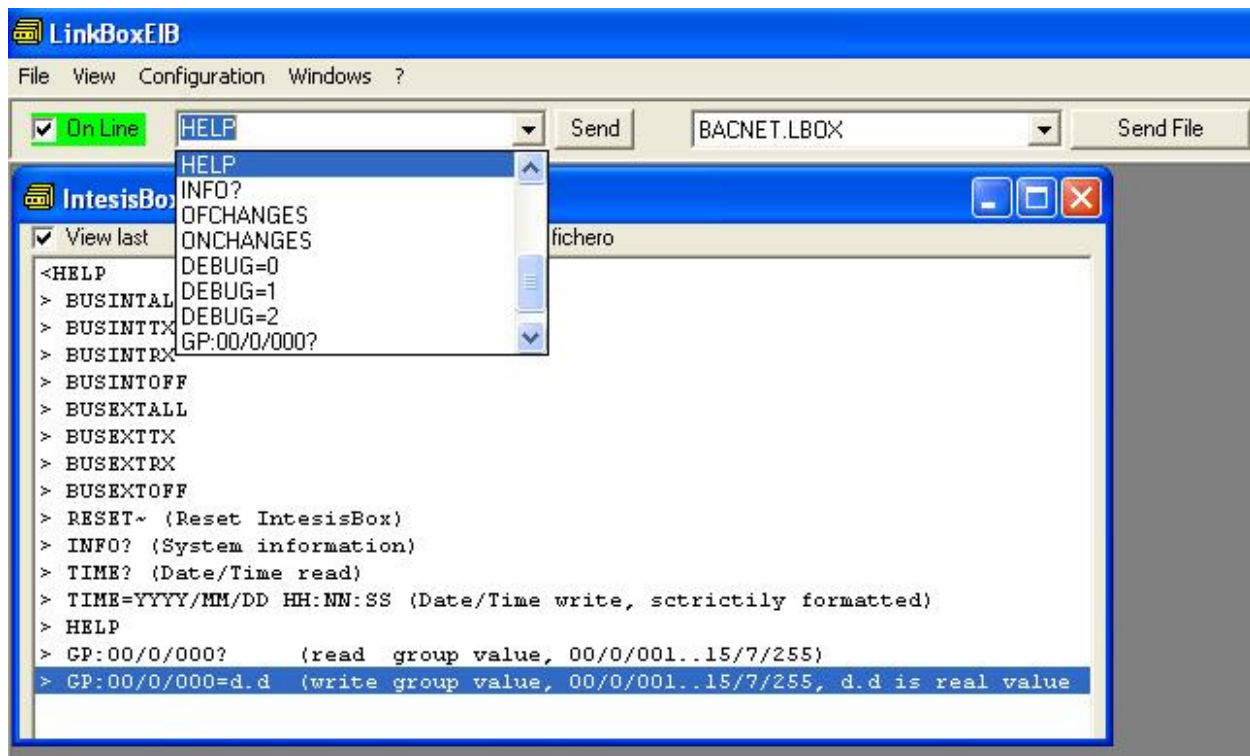
Aceptar Cancelar

This tool is very useful to test any of the systems connected to the IntesisBox, KNX and InnoBUS without the need to actuate on the real signals.

The signals viewer window has a button to copy to the Windows Clipboard all the contents of the window (in tab separated text format).

3.7 System commands

LinkBoxEIB includes an option to send to IntesisBox a set of system commands for debugging and control purposes; this list is available in the commands list as shown in the figure below. To send a command to IntesisBox just select it from the list, or type it with the correct format, and press *Enter* or click on button *Send*. IntesisBox will act accordingly with the command received; the process can be monitored in the IntesisBox Communication Console window. The use of some of these commands can be critical for IntesisBox normal operation, having this in mind use only these commands following the recommendations of Intesis Software technical support. A list of the more commonly used commands and the way to use them will be returned by IntesisBox after sending the HELP command.



3.8 Files

LinkBoxEIB saves IntesisBox configuration in the following files inside the project folder:

PROJECT.INI	Ini file containing general information referent to the project
AIRZONE.INI	Ini file containing the information referent to the connection window and other special adjustments
AIRZONE.DAT	Text file (tab separated values) with the signals information (signals list). This file can be edited (with Excel for example) to change the configuration quicker and easier. Later on, when selecting <i>Configuration</i> -> <i>IntesisBox</i> in LinkBoxEIB, if the changes have been made respecting the correct format, all the changes in the configuration done from Excel can be seen in the signals list.
AIRZONE.LBOX	Binary file created from the information in the files described above. This is the file really uploaded to IntesisBox.

It is strongly recommended to back up the project folder containing these files in external media, once the installation process is finished. This way you will be able to do future configuration changes in case of reinstallation of LinkBoxEIB due, for example, to a failure of the hard disk in the PC where LinkBoxEIB was previously installed.

The configuration cannot be downloaded from IntesisBox to LinkBoxEIB, only can be uploaded; the upload file AIRZONE.LBOX does not contain all the integration information, as for example the signals description.

In the AIRZONE.INI file you can find also the following adjusting parameters:

[EIB]
tS_ChekEIB=60 Check KNX bus time (seconds)
tMS_WaitUpdate=2000 Waiting time to get a response for a Read request (millisec)
tMS_WaitInConect=6000 Waiting time in Connect status (millisec)

Important! Modify only these parameters following the indications of Intesis Software Technical Support, doing it wrongly may lead to IntesisBox malfunctions.

4. Setup process and troubleshooting

4.1 Pre-requisites

It is necessary to have a KNX TP-1 (EIB) system operative and ready to be connected to the KNX port of IntesisBox.

It is necessary to have the InnoBUS network connection near IntesisBox with all Airzone devices connected to this network.

Connectors, connection cables, and PC for LinkBoxEIB are not supplied by Intesis Software for this standard integration. The items supplied by Intesis Software for this integration are:

- IntesisBox gateway with KNX internal protocol and Airzone InnoBUS external protocol firmware loaded.
- Console cable. Standard DB9F-DB9M cable 1.8 meters long.
- LinkBoxEIB software.
- Product documentation.

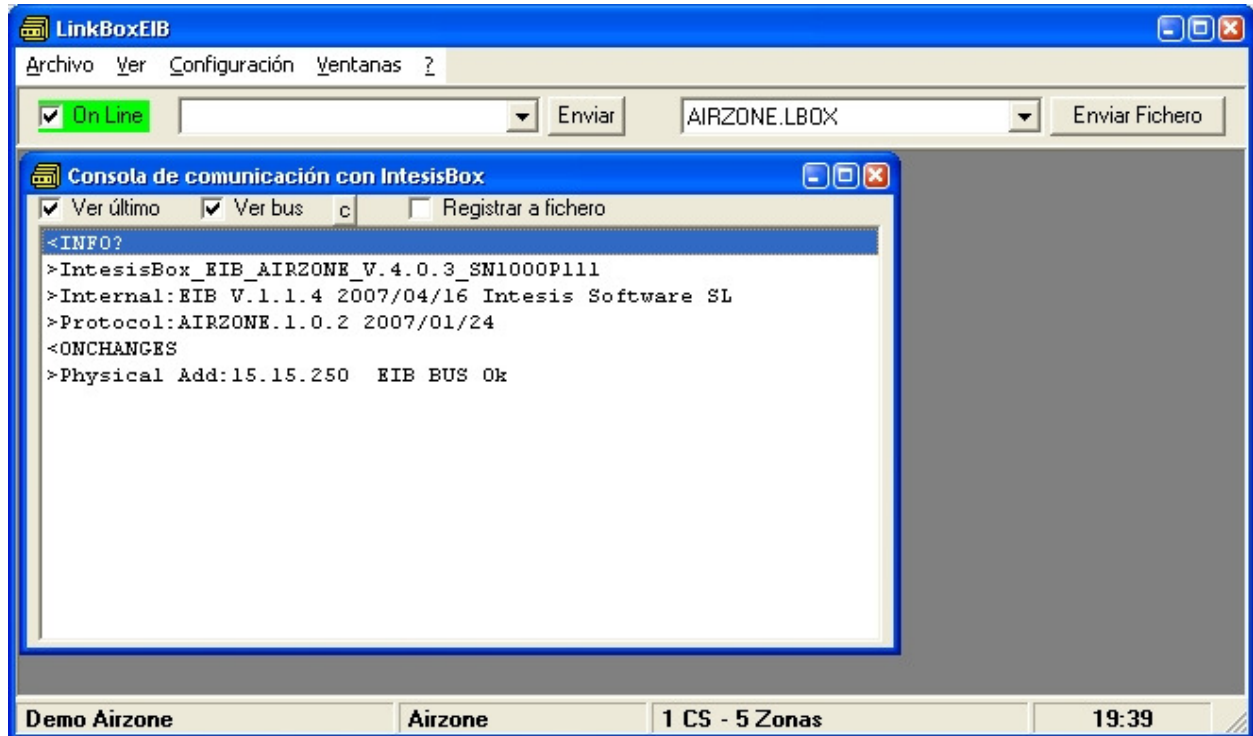
4.2 Setup procedure

1. Install LinkBoxEIB on your laptop.
2. Install IntesisBox in the desired installation site. DIN rail mounting beside an Airzone CS is recommended.
3. Connect the KNX TP-1 (EIB) bus cable to the port marked as **KNX TP-1 (EIB)** of IntesisBox. (See details for this bus cable in section *Connections* of this document).
4. Connect the communication cable coming from the InnoBUS network to the port marked as **AIRZONE** of IntesisBox, use the RS485 port. (See details for this communication cable in section *Connections* of this document).
5. Power up IntesisBox using the 12Vdc aux. output of the Airzone CS, or use a standard power supply 220/125VAC-12VDC/300mA for example.

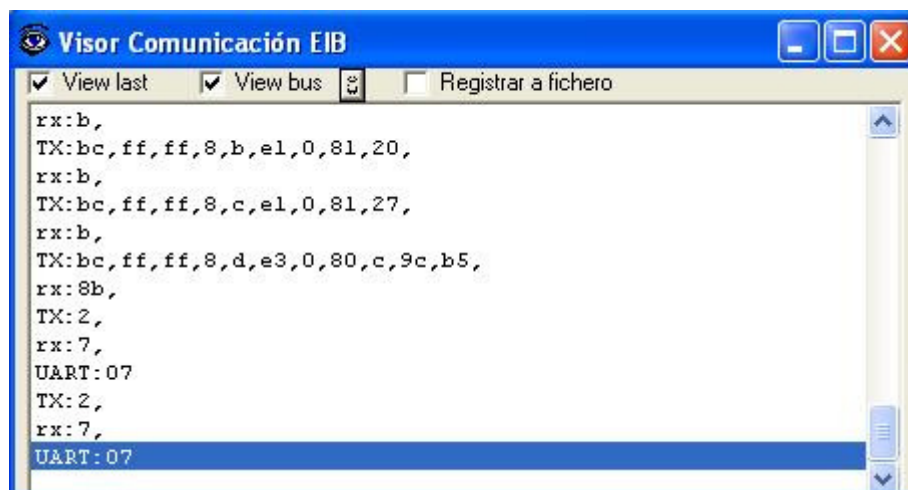
WARNING! In order to avoid earth loops that can damage IntesisBox and/or any other equipment connected to it, we strongly recommend:

- Power IntesisBox using the 12Vdc aux. output of the Airzone CS.
 - In case of use of an external power supply:
 - Use a DC power supply, floating or with the negative terminal connected to earth. **Never use a DC power supply with the positive terminal connected to earth.**
 - Use an AC power supply only if it is floating and not powering any other device.
6. Connect the communication cable coming from the serial port of your laptop PC to the port marked as **PC Console** of IntesisBox. (See details for this communication cable in section *Connections* of this document).

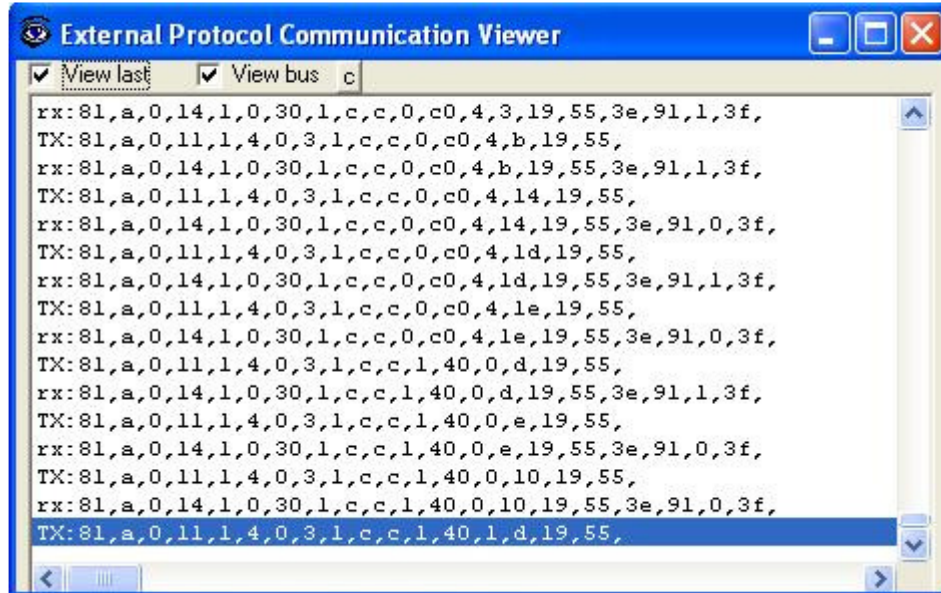
- Open LinkBoxEIB, create a new project selecting a copy of the one named **DEMO Airzone** and give it the name desired, select the serial port used to connect to IntesisBox (menu Configuration -> Connection) and switch working mode to *on-line* (checkbox *off-line/on-line*). The IntesisBox identification must appear in the *IntesisBox communication console* window as showed below.



- Open the *EIB Communication Viewer* window (menu View -> Bus -> EIB) and check that there is communication activity, some TX frames and some other rx frames. This means that the communication with the KNX system is ok. In case there is no communication activity between IntesisBox and the KNX system check that KNX bus is operative and well connected to the IntesisBox.

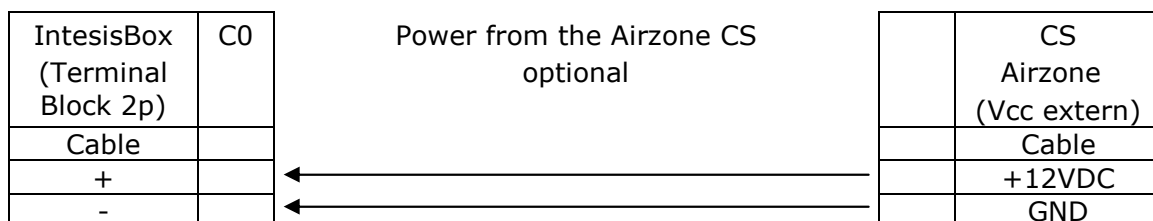
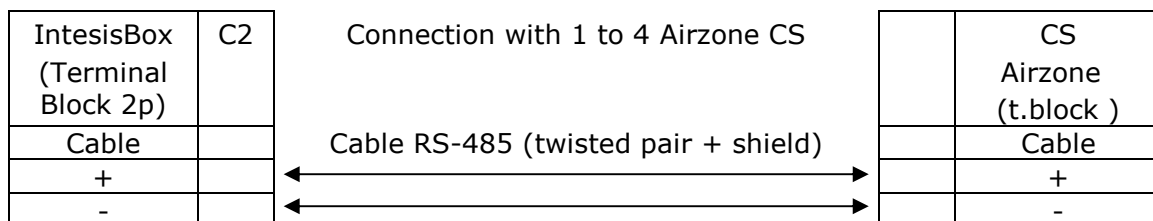
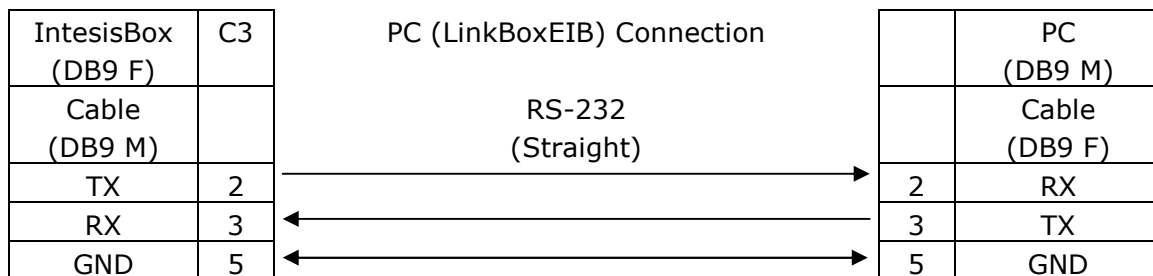
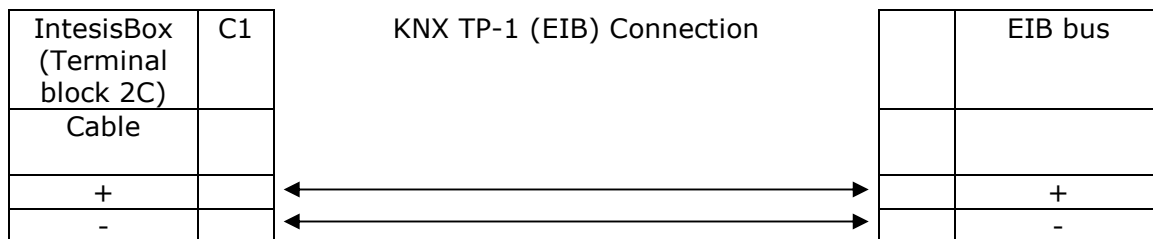
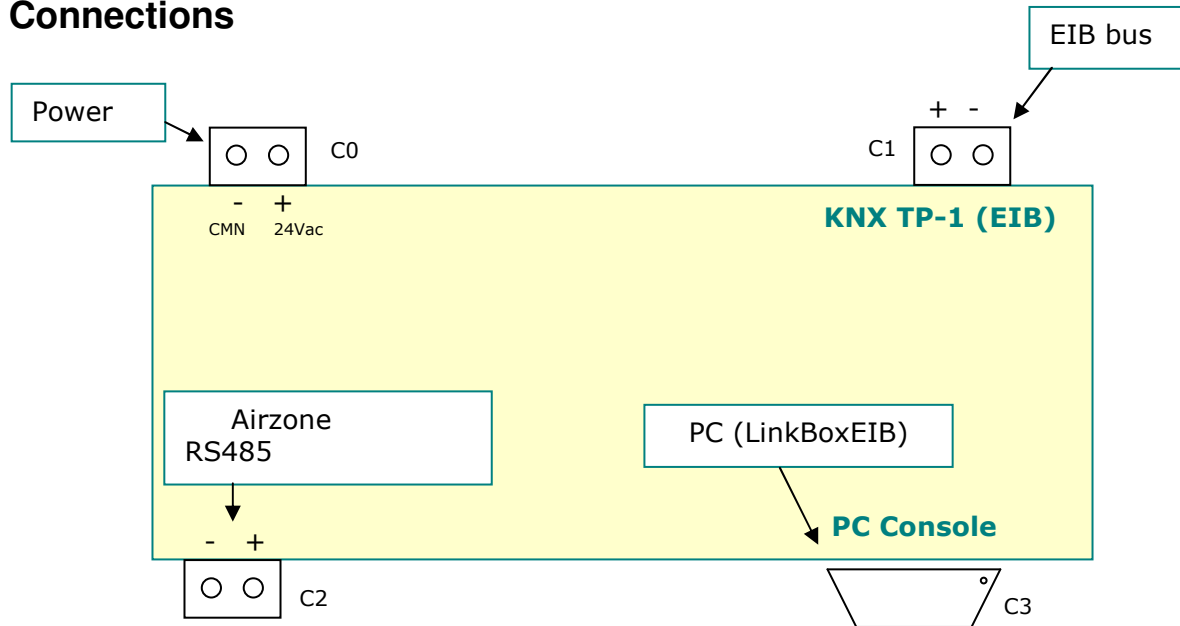


9. Open the *External Protocol Communication Viewer* window (menu View -> Bus -> External system) and check that there is communication activity, some TX frames and some other rx frames as showed in the figure below. This means that the communication with the CS devices is ok.



In case there is no response from the CS devices to the frames sent by IntesisBox, check that they are operative and configured with the correct slave number, check the IntesisBox's KNX interface connection. See details for the communication cable between IntesisBox and CS devices in section *Connections* of this document.

5. Connections



6. Mechanical & electrical characteristics

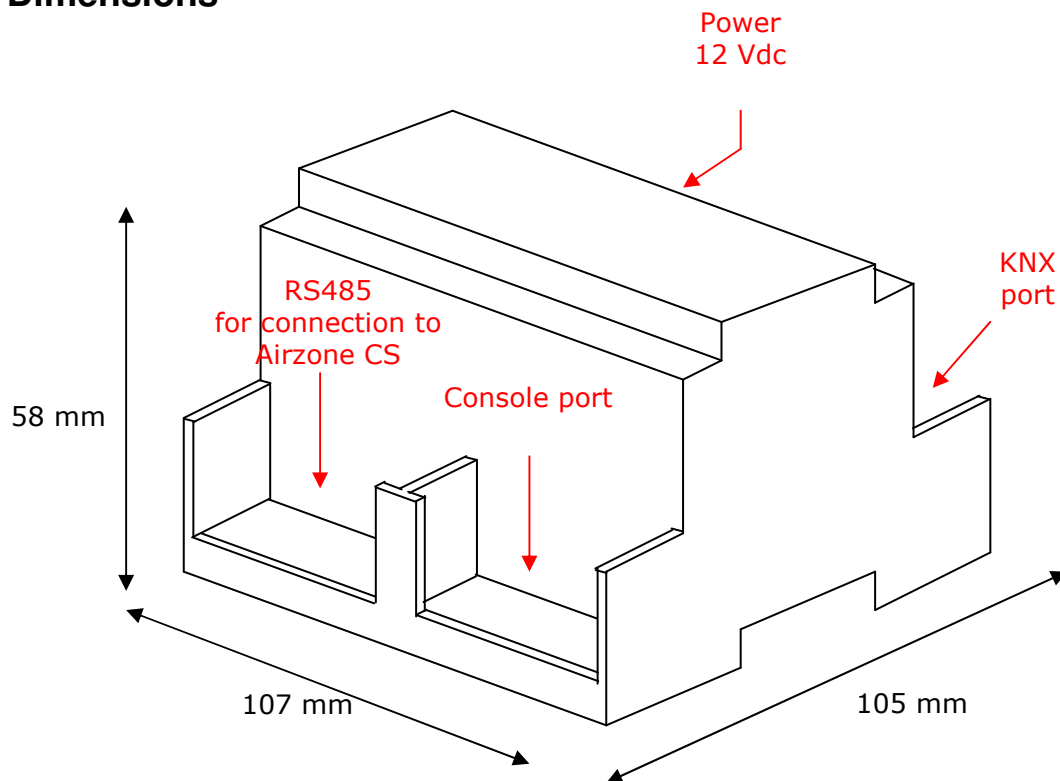


Enclosure	Plastic, type PC (UL 94 V-0). Dimensions: 107mm x 105mm x 58mm.
Colour	Light Grey. RAL 7035.
Power	9 to 30Vdc +/-10% 1.4W. 24Vac +/-10% 1.4VA. Plug-in terminal bloc for power connection (2 poles). Power supply can be taken directly from the 12 Vdc output of the Airzone CS.
Mounting	Surface. Wall. DIN rail EN60715 TH35.
InnoBUS port	1 x RS485. Plug-in screw terminal block (2 poles).
KNX port	1 x KNX TP1 (EIB) port opto-isolated. Plug-in terminal bloc (2 poles).
LED indicators	1 x Power. 2 x KNX port activity (Tx, Rx). 2 x InnoBUS port activity (Tx, Rx). 1 x KNX programming/bus. ¹
Push buttons	1 x KNX programming. ¹
Console port	RS232. DB9 female connector (DCE).
Configuration	Via console port. ²
Firmware	Allows upgrades via console port.
Operational temperature	-40°C to +70°C
Operational humidity	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE

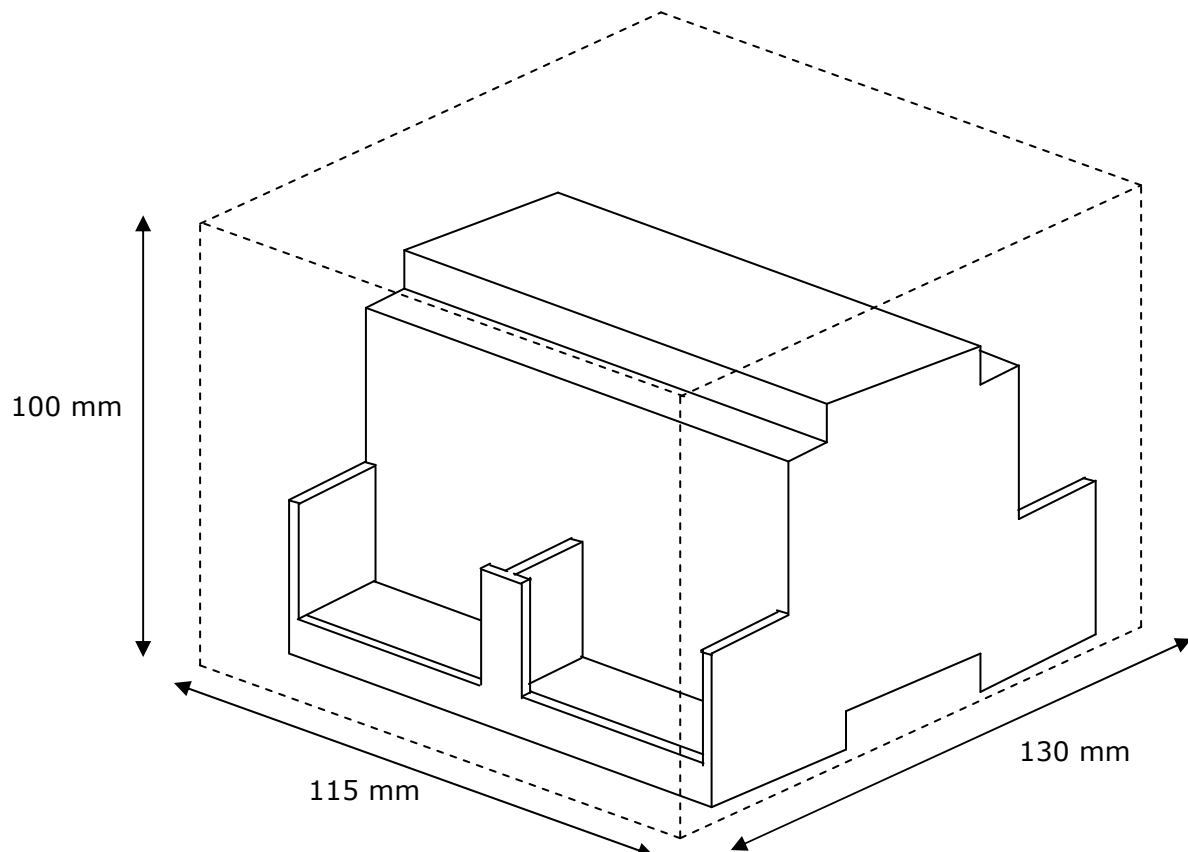
¹ Not operational for the moment. Reserved for future use.

² Standard cable DB9male-DB9female 1,8 meters long is supplied with the device for connection to a PC COM port for configuring and monitoring the device. The configuration software, compatible with Windows® operating systems, is also supplied.

7. Dimensions



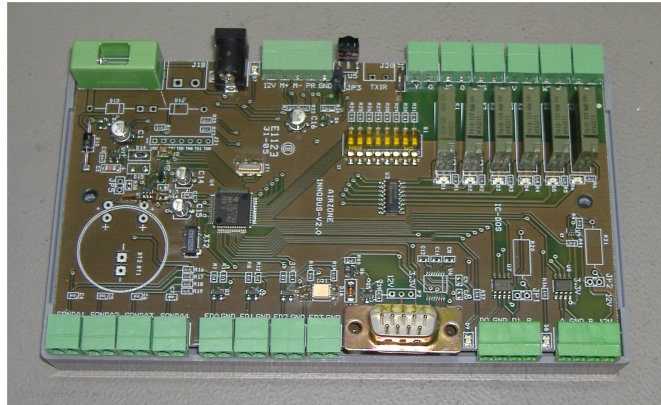
Free space recommended to install the device into a cabinet (wall or DIN rail mounting), with space enough for external connections:



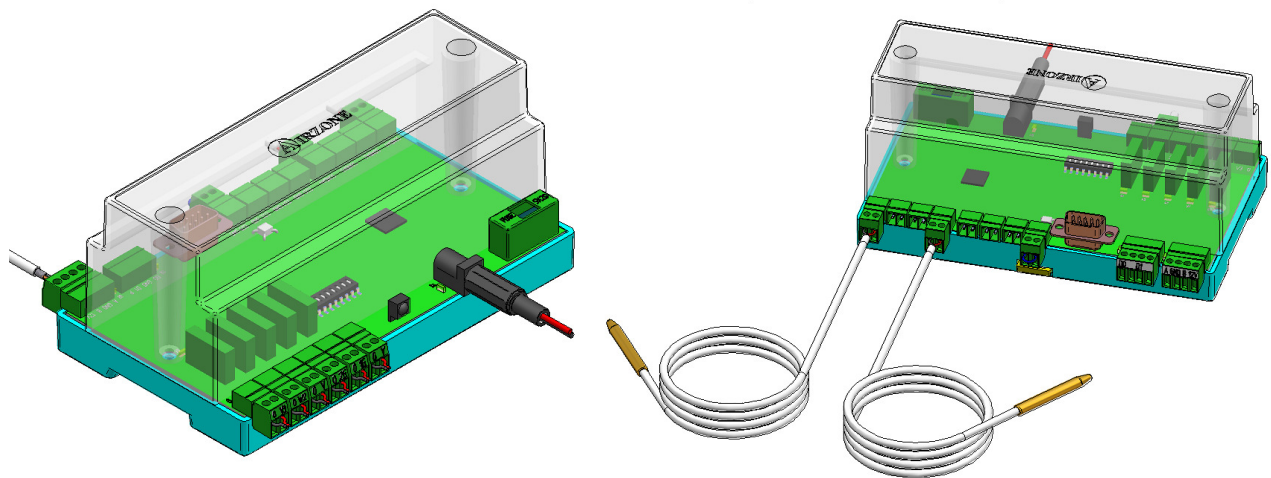
8. Annexes

8.1 InnoBUS

From all the modules of the InnoBUS system, the most important from the point of view of the integration is the System Controller (CS), IntesisBox connects to this module.



Real Image



Simulated Image